CLAIMS

1. (Amended.) A laser processing apparatus for irradiating a work piece with a laser beam to process the irradiated portion comprising:

a laser oscillator for generating said laser beam with a predetermined pulse;

an irradiation position control optical system for causing said laser beam to irradiate a predetermined position on said work piece; [and]

a plurality of optical path systems for guiding the laser beam emitted from said laser oscillator to said irradiation position controlling optical system[,] ; and

a total reflection mirror as optical path switching means, which is capable of proceeding into and retracting from an optical path, for determining which optical path system is used, from said plurality of optical path systems,

wherein said plurality of optical path systems includes at least a first optical path system that guides said laser beam emitted from said laser oscillator to said irradiation position control optical system without changing its energy distribution in the direction perpendicular to the optical axis of the laser beam and a second optical path system that guides said laser beam emitted from said laser oscillator to said irradiation position control optical system while changing its energy distribution in the direction perpendicular to the optical axis of the laser beam, and

said total reflection mirror proceeds into and retracts from the optical path with a speed being synchronized with a off timing of the laser beam in the predetermined pulse of said laser oscillator.

2. (Amended.) A laser processing apparatus for irradiating a work piece with a laser beam to process the irradiated portion comprising:

a laser oscillator for generating said laser beam;

an irradiation position control optical system for causing said laser beam to irradiate a predetermined position on said work piece; and

a plurality of optical path systems for guiding the laser beam emitted from said laser oscillator to said irradiation position controlling optical system[,] ; and

a total reflection mirror as optical path switching means, which is capable of proceeding into and retracting from an optical path, for determining which optical path system is used, from said plurality of optical path systems,

wherein said plurality of optical path systems includes at least a first optical path system that guides said laser beam emitted from said laser oscillator to said irradiation position control optical system without changing the energy intensity of the laser beam and a second optical path system that changes the energy distribution in the direction perpendicular to the optical axis thereof by preventing a portion of the laser beam emitted from said laser oscillator from reaching said irradiation position control optical system, and

said total reflection mirror proceeds into and retracts from the optical path with a speed being synchronized with a off timing of the laser beam in the predetermined pulse of said laser oscillator.

3. (Cancelled.) [A laser processing apparatus according to claim 1 or 2, further comprising optical path switching means for switching the optical path that is used in guiding said laser beam.]

4. (Cancelled.) [A laser processing apparatus according to claim 1 or 2, wherein the switching of said optical path systems is performed during an off-time of the pulse irradiation of said laser beam.]

5. (Original.) A laser processing apparatus according

to claim 1 or 2, wherein the second optical path system that changes the energy distribution of said laser beam includes a mask that makes the energy distribution in the direction perpendicular to the optical axis of the laser beam substantially uniform.

6. (Original.) A laser processing apparatus according to claim 5, wherein the second optical path system that changes the energy distribution of said laser beam includes a homogenizer that makes the energy distribution in the direction perpendicular to the optical axis of the laser beam substantially uniform.

7. (Amended.) A laser processing method for irradiating a work piece with a laser beam to process the irradiated portion, comprising:

a first processing step of irradiating a predetermined position on said work piece with a laser beam emitted from a laser oscillator without changing its energy distribution in the direction perpendicular to the optical axis of said laser beam;

a laser beam switching step of [stopping] switching a laser beam to be used after completing said first processing step, from [the irradiation with] said laser beam that is not changed in its energy distribution [and guiding] to a laser beam that is formed by changing the energy distribution in the direction perpendicular to the optical axis, of the laser beam emitted from said laser oscillator, by inserting a total reflection mirror into and retracting said total reflection mirror from an optical path of said laser beam [to said predetermined position on said work piece]; and

a second processing step of performing irradiation with said laser beam that has been changed in the energy distribution onto said predetermined position on said work piece.

8. (Cancelled.) A processing method according to claim 7, wherein said laser beam switching step is performed during an off-time of the pulse irradiation of the laser beam emitted from said laser oscillator.

9. (Original.) A method according to claim 7, wherein the energy intensity distribution of said laser beam that has been changed in the energy distribution guided onto said work piece is made uniform.

10. (Amended.) A method of manufacturing a circuit board comprising a step of performing a perforation processing on a ceramic green sheet and a step of filling the hole formed with an electrode material, said perforation processing comprising:

a first processing step of irradiating a predetermined position on said ceramic green sheet with a laser beam emitted from a laser oscillator without changing its energy distribution in the direction perpendicular to the optical axis of said laser beam;

a laser beam switching step of [stopping] switching a laser beam to be used after completing said first processing step, from [the irradiation with] said laser beam that is not changed in its energy distribution [and guiding] to a laser beam that is formed by changing the energy distribution in the direction perpendicular to the optical axis, of the laser beam emitted from said laser oscillator, by inserting a total reflection mirror into and retracting said total reflection mirror from an optical path of said laser beam [to said predetermined position on said work piece]; and

a second processing step of performing irradiation with said laser beam that has been changed in the energy distribution onto said predetermined position on said work piece.